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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of inventor(s):

Hsiang Lan Lung

Application No. **10/771,023**

Confirmation No. **3519**

Filing Date: **03 February 2004**

Title: **Trap Read Only Non-Volatile
Memory (TROM)**

Group Art Unit: **2824**

Examiner: **Eric J. Wendler**

CUSTOMER NO. 22470

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Commissioner for Patents

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PRE-APPEAL BRIEF REQUEST FOR REVIEW

Sir:

In response to the Advisory Action Before the Filing of an Appeal Brief mailed 15 June 2006, applicants request a pre-appeal brief review because of clear errors in the examiner's rejections. The Advisory Action Before the Filing of an Appeal Brief mailed 15 June 2006 sets a period for reply expiring 4 months from the 8 February 2006 mailing date of the final rejection, or 08 June 2006. A one month extension of time to 08 July 2006 and notice of appeal accompany this request.

In the present application, claims 1-29 are rejected as being obvious over various combinations that all include Sakui et al. (U.S. Patent No. 6,307,807) in view of Lee et al. ("A Novel Structure of SiO₂/SiN/High k Dielectrics, Al₂O₃ for SONOS Type Flash Memory", Extended Abstracts of the 2002 International Conference on Solid State Devices and Materials, Nagoya, 2002, pp.162-163).

The Examiner has identified a motivation to combine the SONOS or SANOS structures of Lee with the memory system of Sakui in order to solve the problem of considerable charge loss due to direct tunneling in conventional SONOS cells, as mentioned in section 1 of Lee. Office Action mailed 23 August 2005, p. 4. This is a clear error.

In particular, the Examiner cited a motivation to combine from Section 1 of the secondary reference Lee, which states that "considerable charge loss of the SONOS due to

[direct band-to-band] tunneling through the very thin tunnel oxide is an obstacle for the SONOS to be applied as a commercial flash memory....” The primary reference of Sakui relied on the by the examiner uses flash EEPROM cells, not SONOS cells. Sakui, column 11, lines 45-46. Thus, the motivation to combine set forth by the Examiner is a clear error, because the “problem of considerable charge loss” addressed by Lee is a problem afflicting SONOS cells, and not the flash EEPROM cells of Sakui. Furthermore, the current mechanism of direct band-to-band tunneling, cited by Lee as problematic, is different from the current mechanism of Fowler-Nordheim tunneling used by the flash EEPROM cells of Sakui. Sakui, column 14, lines 63-66. For these reasons, the motivation to combine cited by the Examiner is a clear error.


The motivation to combine cited by the Examiner is a clear error, also because the combination of Sakui with Lee would render Sakui inoperable for its intended purpose. MPEP 2143.01 (“V. THE PROPOSED MODIFICATION CANNOT RENDER THE PRIOR ART UNSATISFACTORY FOR ITS INTENDED PURPOSE”). Sakui’s invention is directed at a memory cell that permits negative threshold voltage. column 17, lines 29-33 and Figs. 6 and 7. A memory cell with a negative threshold voltage is on, even if the control voltage is only 0V. The benefits of a memory system that allows a memory cell to store a negative threshold voltage are as follows. First, circuitry for preventing over-erase is not required. col. 15, lines 31-34. Second, because over-erase is not a concern, a large electric field can be applied to erase a cell, which shortens erase time, in comparison with a small electric field. col. 14, lines 55-62. However, Lee discloses a SONOS cell that only has positive threshold voltages. A memory system of Sakui which incorporates a SONOS memory cell as taught by Lee would therefore have the disadvantages of requiring circuitry for preventing over-erase, and long erase times required by small electric fields. Thus, the combination of Sakui with Lee would render Sakui inoperable for its intended function, and the Examiner’s combination is impermissible.

For at least these reasons, the obviousness rejections of claims 1-29 based on combinations including Sakui et al. in view of Lee et al. are improper. Applicants respectfully submit that the pending claims are allowable.

Fee Authorization. The Commissioner is authorized to charge any fee determined to be due in connection with this communication, or credit any overpayment, to our Deposit Account No. 50-0869 (MXIC 1564-1).

Respectfully submitted,

Dated: 29 June 2006



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